

ABSTRACT OF THE DISCLOSURE

A multi-layer diffraction type polarizer and a liquid crystal element capable of realizing a stable high extinction ratio is provided. Further, a liquid crystal
5 element is obtained, which can rotate the polarization direction maintaining high linearity of output light when linearly polarized light is incident.

A multi-layer diffraction type polarizer is formed by laminating at least two polarizing diffraction
10 gratings each having a birefringent material which straightly transmits incident light having a first polarization direction without functioning as a diffraction grating, and diffracts incident light having a second polarization direction perpendicular to the
15 first polarization direction by functioning as a diffraction grating.

Further, in order to realize an optical attenuator having a high extinction ratio even at low voltage, a phase plate made of an organic thin film is provided to
20 cancel the retardation of the liquid crystal cell remaining when the voltage is applied. Further, in order to rotate the polarization direction of a linearly polarized incident light, the liquid crystal cell is provided with a $\lambda/4$ phase plate comprising an organic
25 thin film.